



1 AMP CURRENT SOURCE



CS-2000-U



CS-2000-E

USER MANUAL

<p>BC BIOMEDICAL CS-2000 SERIES TABLE OF CONTENTS</p>
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<p><u>This User Manual covers the following units:</u></p>
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| <ul style="list-style-type: none">• CS-2000-U• CS-2000-E |
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WARNING - USERS

The CS-2000 is for use by skilled technical personnel only.

WARNING - USE

The CS-2000 is intended for testing only and should never be used in diagnostics, treatment or any other capacity where they would come in contact with a patient.

WARNING - CONNECTIONS

All connections to patients must be removed before connecting the DUT to the CS-2000. A serious hazard may occur if the patient is connected when testing with the unit. Do not connect any leads from the patient directly to the unit or DUT while it is powered by the Analyzer.

WARNING - CLEANING

Disconnect Line Power to the CS-2000 before attempting to clean it. Do not immerse. The unit should be cleaned by wiping gently with a damp, lint-free cloth. A mild detergent can be used if desired.

WARNING - LIQUIDS

Do not submerge or spill liquids on the CS-2000. Do not operate the CS-2000 if internal components not intended for use with fluids may have been exposed to fluid, as the internal leakage may have caused corrosion and be a potential hazard.

WARNING - MODIFICATIONS

The CS-2000 is intended for use within the published specifications. Any application beyond these specifications or any unauthorized user modifications may result in hazards or improper operation.

CAUTION - USAGE

The CS-2000 is not a continuous duty device, it is intended for short duration testing within the current limits specified. Do not leave the DUT connected to this unit for extended time periods.

CAUTION - ENVIRONMENT

Exposure to environmental conditions outside the specifications can adversely affect the performance of the CS-2000. If the unit is outside of Operating specifications, allow it to acclimate to specified conditions for at least 30 minutes before attempting to operate it.



CAUTION - INSPECTION

The CS-2000 should be inspected before each use for obvious signs of abuse or wear. The unit should not be used and should be serviced if any parts are in question.

CAUTION - SERVICE

The CS-2000 is intended to be serviced only by authorized service personnel. Troubleshooting and service procedures should only be performed by qualified technical personnel.

NOTICE – SYMBOLS

<u>Symbol</u>	<u>Description</u>
	Caution (Consult Manual for Further Information)
	Electrical Caution (Consult Manual for further information)

NOTICE – ABBREVIATIONS

A or Amp	Ampere(s)
AAMI	Association for the Advancement of Medical Instrumentation
C	Celsius
°	Degree(s)
DUT	Device Under Test
Euro	European
Hz	Hertz
IEC	International Electrotechnical Commission
kg	kilogram(s)
mm	millimeter(s)
Ω	ohm(s)
lbs	pounds
RH	Relative Humidity
RMS	Root Mean Square
s	second(s)
USA	United States of America
V	Volt(s)
VA	Volt-Ampere(s)
VAC	Volt(s) Alternating Current
W	Watt(s)

NOTICE – DISCLAIMER

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NOTICE – CONTACT INFORMATION

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<p style="text-align: center;">BC BIOMEDICAL CS-2000 SERIES 1 AMP CURRENT SOURCE</p>

The CS-2000 Series is a 1 Amp Current Source for testing the ground continuity in equipment. This device facilitates testing to IEC601 requirements, where a 1 A source current is required. This device interfaces directly with BC Biomedical SA-2000 series of Safety Analyzers as well as the Dale 544D & 544D Lite, and Dale 601 & 601E Safety Analyzers.

CS-2000 SERIES:

- FACILITATES TESTING TO IEC601 REQUIREMENTS
- INTERFACES DIRECTLY TO BC BIOMEDICAL SA-2000 SERIES OF SAFETY ANALYZERS
- INTERFACES TO DALE 544D, 544D LITE, 601 AND 601E SAFETY ANALYZERS
- 90 – 264 VAC OPERATION (50/60 Hz)
- 1 AMP CURRENT SOURCE FOR RESISTANCE MEASUREMENTS
- NO PROTRUDING PUSH BUTTONS
- LIGHT TOUCH KEY USED TO OPERATE
- SMALL SIZE

AVAILABLE MODELS:

- CS-2000-U: STANDARD MODEL WITH HOSPITAL-GRADE NEMA 5-15P LINE PLUG AND HOSPITAL-GRADE NEMA 5-15R DUT TEST RECEPTACLE FOR USE IN THE USA AND OTHER COMPATIBLE COUNTRIES.
- CS-2000-E: EUROPEAN MODEL WITH SCHUKO LINE PLUG AND SCHUKO DUT RECEPTACLE FOR USE IN APPLICABLE EUROPEAN COUNTRIES.

ACCESSORIES

- BC20 – 20221 SCHUKO GROUNDING ADAPTER
- BC20 – 20114 REPLACEMENT KELVIN LEAD FOR CS-2000
- BC20 – 30106 SOFT-SIDED CARRYING CASE

LAYOUT

This section looks at the layout of the CS-2000 and gives descriptions of the elements that are present.



CS-2000-U Layout



CS-2000-E Layout

OPERATION

The CS-2000 1 Amp current source is not a stand-alone device. It is designed to work in conjunction with a BC Biomedical SA-2000 Series Safety Analyzer or a DALE 544D, 544D Lite, 601, and 601E Safety Analyzer.

Push To Test Key

Pressing and holding this key initiates a test.

This applies the 1 Amp current source to the Device Under Test (DUT).

LED Indicator

This LED gives the operator visual feedback on the test status.

The following table explains the meaning of each possible LED status indication:

LED Status	Meaning
OFF	Test is not functional
ON	Test is Valid
BLINKING	Resistance is greater than 3 ohms

Connections

1. The Line plug on the CS-2000 plugs into the Safety Analyzer DUT Receptacle.
2. The Chassis cable, located at the top-right corner of the CS-2000, plugs into the Chassis Connection port on the Safety Analyzer.
3. The DUT plugs into the CS-2000 Receptacle cable.
4. The detachable cable, located at the bottom-right corner of the CS-2000, is used to connect to the chassis of the DUT.

Below is a typical example for wiring configuration of the Safety Analyzer (BC International SA-2005 shown), the CS-2000 (CS-2000-U model shown) Current Source and the DUT (in this case a Patient Monitor).



TESTING

WARNING

All connections to patients must be removed before connecting the DUT to the CS-2000 or Analyzer. A serious hazard may occur if the patient is connected when testing with the Analyzer. Do not connect any leads from the patient directly to the CS-2000 or Analyzer from the DUT.

1. Connect the CS-2000 to the Safety Analyzer and the DUT as indicated in the Connections portion of the Overview Section.
2. Set the Safety Analyzer for Forward Polarity with Hot and Neutral Closed.
3. Set the Safety Analyzer to read earth resistance. The safety analyzer display will read approximately 0.67 ohms.

NOTE: When the CS-2000 is connected to the Safety Analyzer and the Push to Test button is not held, bias voltages cause a reading to be displayed on the Safety Analyzer. This reading is approximately 0.67 ohms. This is not a true reading of the DUT. Valid tests are indicated only when the CS-2000 Status LED is continuously lit; readings on the Safety Analyzer in all other situations should be ignored.

4. On the CS-2000, press and hold the Push to Test key.
5. Verify the validity of the test by checking the LED on the CS-2000.

NOTE: A continuously lit LED indicates a valid test.

6. Read the resistance on the Safety Analyzer.

MANUAL REVISIONS

<u>Revision #</u>	<u>Revisions Made</u>
Rev 01	Origination
Rev 02	Updated Pictures
Rev 03	Specifications Updated, Misc. Edits
Rev 04	Format Updated, Pictures Updated, Misc. Edits
Rev 05	Misc. Edits

LIMITED WARRANTY

WARRANTY: BC GROUP INTERNATIONAL, INC. WARRANTS ITS NEW PRODUCTS TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP UNDER THE SERVICE FOR WHICH THEY ARE INTENDED. THIS WARRANTY IS EFFECTIVE FOR TWELVE MONTHS FROM THE DATE OF SHIPMENT.

EXCLUSIONS: THIS WARRANTY IS **IN LIEU OF** ANY OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF **MERCHANTABILITY** OR FITNESS FOR A PARTICULAR PURPOSE.

BC GROUP INTERNATIONAL, INC. IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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REMEDIES: THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY SHALL BE: (1) THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS OR PRODUCTS, WITHOUT CHARGE. (2) AT THE OPTION OF **BC GROUP INTERNATIONAL, INC.**, THE REFUND OF THE PURCHASE PRICE.

SPECIFICATIONS

Electrical		
CURRENT SOURCE		1.00 to 1.02 A DC
OPERATING LINE VOLTAGE		90 to 264 VAC, 50/60 Hz
POWER CONSUMPTION		12 VA (12 W)
LOAD CURRENT		This device is an accessory to a Safety Analyzer, refer to applicable Safety Analyzer User Manual for this Rating
LINE PLUG	CS-2000-U	NEMA 5-15P
	CS-2000-E	European CEE 7/7 “Schuko”
DUT RECEPTACLE	CS-2000-U	Hospital Grade NEMA 5-15R
	CS-2000-E	European CEE 7/7 “Schuko”
CONNECTIONS		3 Pin Locking Plug for Safety Analyzer Chassis Cable Connection (See Description section for Compatible Safety Analyzers) Detachable Kelvin Cable (BC20-20114) for DUT Ground Connection
Physical		
CONSTRUCTION	ENCLOSURE	ABS Plastic
	OVERLAY	Back-printed Lexan
SIZE	7.38 x 3.94 x 1.64 Inches (187.5 x 100.1 x 41.7 mm)	
WEIGHT	< 1 Lbs (0.45 kg)	
OPERATING RANGE	0 to 50 °C (32 to 122 °F) 10 to 90% RH, Non-Condensing	
STORAGE RANGE	-40 to 60 °C (-40 to 140 °F)	

NOTES

NOTES



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